

REMARKS

Claims 1 to 35 are now pending in this application. Claims 19 to 29 have been withdrawn by the Office as directed to non-elected subject matter. Claim 1 has been amended, e.g., to correct informalities, to recite running the classification algorithm to classify the first image or a second image into regions of interest at a pixel level of processing, wherein the first or second image selected for classification is a classified image (making clear that the classification algorithm can be run on the original image or a different image after performing the preceding steps), and to add a step of outputting analysis results. Dependent claims 2 to 18 have been amended, e.g., to correct informalities and to conform to amended claim 1. New claims 30 to 35 have been added. Support for the amendments and new claims can be found throughout the application, e.g., at page 26, lines 6 to 15, page 38, lines 19 to 28, and at page 48, lines 15 to 23. The specification has been amended in an attempt to remove browser executable code, as requested by the Office. The amendments and new claims add no new matter to the specification.

Applicant thank Examiner Sims for taking the time to have a telephone conversation with applicant's representative on November 22, 2006, to provide applicant with his guidance on the rejection of claims 1, 2, 4 to 6, 8, 9, 11, 13 to 15, and 17, under 35 U.S.C. §101. Applicant has attempted to incorporate the Examiner's suggested claim amendments into claim 1, which is discussed in further detail below.

Objection to the Specification

The specification was objected to for reciting browser executable code at page 18, paragraph 0062. Applicant has amended the paragraph accordingly. Applicant believes that the terms are no longer browser executable. Accordingly, applicant requests that the objection to the specification be reconsidered and withdrawn.

Objection to the Claims

Claims 1 to 3, 6, 9 to 11, and 15 to 17 have been objected to for reciting the term "ROI." Applicant has amended independent claim 1 to recite region of interest (ROI), thus clarifying the term in claim 1 and all dependent claims. Accordingly, applicant requests that the present objection be reconsidered and withdrawn.

35 U.S.C. §101

Claims 1, 2, 4 to 6, 8, 9, 11, 13 to 15, and 17, were rejected as allegedly directed to non-statutory subject matter. In support of this rejection, the Office Action states (at page 3):

In the instant case, the claims are directed to a method of image analysis comprising transforming an image into a feature space, extracting features, ranking the extracted features, classifying the image into regions of interest. In the instant case, the method of claims does not result in a physical transformation of matter, nor is any concrete, tangible and useful result produced/recited. Therefore, these claims are not statutory.

Applicant respectfully traverses this rejection. As a threshold issue, applicant submits that the Office has not established a *prima facie* case that the present claims are directed to non-statutory subject matter. On the issue of establishing a *prima facie* case, the Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility state:

The burden is on the USPTO to set forth a *prima facie* case of unpatentability. Therefore if the examiner determines that it is more likely than not that the claimed subject matter falls outside all of the statutory categories, the examiner must provide an explanation.

In reiterating applicants' claim language and then immediately concluding that applicants' claims do "not result in a physical transformation of matter" and that they do not provide "any concrete, tangible and useful result," the Office has not satisfied its burden of providing a substantive explanation as to why or how the Office has reached such a conclusion. Thus, applicant submits that the Office has not establish a *prima facie* case in this instance.

Further, even if the Office had somehow established a *prima facie* case, it would not be sustainable because the methods recited in the claims do in fact result in a "concrete, tangible and useful result." However, in the interest of moving the present application toward allowance, applicant has amended claim 1 to recite outputting analysis results. Applicant thanks Examiner Sims for taking the time to have a telephone conversation on November 22, 2006, to provide the undersigned with his guidance on this issue. Applicant respectfully submits that the amended claims result in a "concrete, tangible and useful result" and are directed to statutory subject matter under 35 U.S.C. §101. Applicant therefore requests that the present rejection be reconsidered and withdrawn.

35 U.S.C. §102(e)

Claims 1, 2, 4 to 6, 8, 9, 11, 13 to 15, and 17 have been rejected as allegedly anticipated by Akselrod (US Patent No. 6,858,007). Assuming, but not conceding, that Akselrod is prior art citable against the present claims, applicant respectfully traverses this rejection.

Akselrod describes a method of automatic classification of adnexal masses in ultrasound and other images. For example, Akselrod at col. 3, lines 5 to 14, describes a method that involves (a) obtaining a cross-sectional or projectional image of an examined adnex including the adnexal mass; (b) extracting boundaries of the adnexal mass, and (c) using a first algorithm for quantifying at least one morphological feature of the adnexal mass.

Applicant's claim 1 recites a method that involves a step of "ranking the extracted features based on feature performance for successful detection of a selected ROI at a pixel level of processing." At least this step of ranking based on feature performance is missing from Akselrod. Applicant's specification describes how ranking works and its benefits, e.g., at pages 21 to 22, paragraphs 0070 and 0071:

pixel features [R, G, B, H, S, V, GI, RG, RB, GB] are ranked according to their effectiveness in discriminating ROIs. Feature ranking is performed using any combinatorial optimization algorithm known in the art such as add-on or forward-backward ranking algorithm to first iteratively rank each single feature (singlet), R, G, B, H, S, V, GI, RG, RB, GB, from best feature to worst feature. Feature

performance is based on the degree of successful detection of a ROI annotation that is made by the user and reserved for performance testing. For example, if a user selects four ROIs, two ROI selections will be reserved to test the performance of features obtained from the other two ROI selections. Each singlet will be then ranked accordingly using the combinatorial optimization algorithm.

The combinatorial optimization algorithm proceeds to then iteratively rank pairs of features (doublets). For example, the first ranked singlet will be paired with another feature and the performance of both features in combination will be ranked against other doublets. The combinatorial optimization algorithm proceeds to then iteratively rank sets of three features (triplets). For example, the first ranked doublet will be combined with another feature to form a triplet of features, which will be ranked against other triplets. The algorithm ranks singlets, doublets, triplets, and quadruplets and so on until the improvement in performance for detecting a ROI reaches a predetermined value or point of diminishing returns at which point a feature singlet, doublet or triplet is selected. For example, the highest ranked triplet may provide only a small percent increase in performance over the highest ranked doublet in which case, the doublet would be the selected feature combination to be employed in classification under "PIXEL LEARN." This estimation of the point of diminishing returns advantageously enhances real-world performance by avoiding data-overfitting or memorization during learning. That is, the iterative optimization algorithm automatically finds the minimum feature dimension that offers the best classification accuracy.

Akselrod fails to teach, or even suggest, performing feature ranking based on performance as described in applicants' specification. Rather, the columns of Akselrod to which the Office Action points (i.e., columns 10 and 14) describe using thresholding techniques, i.e., techniques wherein a feature of interest is compared to a predetermined threshold to segment medical images. Thus, Akselrod does not anticipate pending claim 1 because it does not teach each and every step of the recited method.

Claims 2, 4 to 6, 8, 9, 11, 13 to 15, and 17, all depend from claim 1, and are thus patentable for at least the reasons discussed above. In addition, Akselrod does not anticipate these dependent claims because it fails to teach, or even suggest, e.g., performing image analysis using additional levels of processing, e.g., second and third levels of processing, such as subimage processing and/or object processing.

For the reasons discussed above, applicant respectfully submits that Akselrod does not anticipate the pending claims. Thus, applicant requests that the present rejection be reconsidered and withdrawn.

35 U.S.C. §103

Claims 3, 7, 10, 12, 16, and 18, were rejected as allegedly obvious over Akselrod in view of Levenson et al. (U.S. Patent No. 6,750,964). Assuming, but not conceding, that Levenson is prior art citable against the present claims, applicant respectfully traverses this rejection.

The deficiencies of Akselrod are discussed above. Levenson does not remedy those deficiencies. Levenson describes, *inter alia*, a method for identifying target features from one or more images of an unknown sample. The method entails obtaining reference image cubes using a spectral illuminator, processing reference data and defining spectral weighting functions, illuminating the sample with the spectral weighting function and recording images, and processing images and identifying regions of interest (see, e.g., Levenson at col. 3, lines 37 to 67). Levenson, like Akselrod, fails to teach, or even suggest, a step of "ranking the extracted features based on feature performance for successful detection of a selected ROI at a pixel level of processing." Thus, even if Levenson were somehow combined with the disclosure of Akselrod, the presently claimed methods would not have been obtained, because at least the step of ranking based on feature performance is not taught or suggested in either reference.

Further, with respect to claims 7, 10, 12, 16, and 18, Levensen, like Akselrod, fails to teach, or even suggest, e.g., performing image analysis using additional levels of processing, e.g., second and third levels of processing, such as subimage processing and/or object processing.

Thus, the Office has failed to establish a *prima facie* case of obviousness against claims 3, 7, 10, 12, 16, and 18, because, *inter alia*, these publications do not teach or suggest all steps recited in these claims. Neither Akselrod nor Levenson, individually or in combination, renders the present claims obvious. Accordingly, applicant requests that the present rejection be reconsidered and withdrawn.

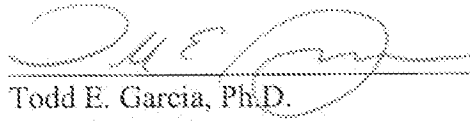
CONCLUSION

Applicant requests that all claims be allowed. Enclosed is a Petition for a Two-Month Extension of Time. The fees in the amount of \$225.00 are being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. It is understood that this perfects the application and no additional papers or filing fees are required. However, please apply any other charges or credits to deposit account 06-1050, referencing Attorney Docket No. 14255-035001.

Respectfully submitted,

Date: _____

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